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ABSTRACT

Aspects of Piaget's theory were applied in the studies reported which examine two aspects of children's information processing of television commercials--selection of information and cognitive processing of information. Children's selection of information was indexed in terms of patterns of attention to television commercials in the natural environment of the home. Children's cognitive processing of information was indexed in terms of responses to a variety of questions concerning TV commercials and programs. Two sets of studies are reported here. The early studies included upper middle class children, 5-12 years old, and the later study included children aged 4-8. In the early studies, data was collected in the home. Attention behavior data was collected by mothers, and interview data related to children's processing of information was collected by pairs of interviewers. In the later study, attention behavior and interview data were collected in the school by observer-interviewers. Responses to the various questions in both studies are highly consistent with Piaget's theoretical discussion regarding differences in the cognitive structures of preoperational and concrete operational children. Results are reported on the basis of three cognitive levels which were identified: low cognitive level, medium cognitive level, and high cognitive level. Results indicate that what is learned by children increases with age and that part of this increase is due to changes in cognitive development. (CS)

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APPENDIX III

Children's Information Processing of Television Commercial Messages*

by

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CHILDREN'S INFORMATION PROCESSING OF TELEVISION COMMERCIAL MESSAGES

The general focus of this paper is on children's information processing of commercial messages. Our basic theoretical orientation relies heavily upon Piaget's theory of cognitive development, a theoretical orientation which has only recently gained prominence in studies of children's communication behavior (Flavell, 1968) and information processing (Farnham-Diggory, 1972).

Aspects of Piaget's theory were applied in the design of social studies which examine two aspects of children's information processing of television commercials--selection of information and cognitive processing of information. Children's selection of information was indexed in terms of patterns of attention to television commercials in the natural environment of the home. Children's cognitive processing of information was indexed in terms of responses to a variety of questions concerning TV commercials and programs.(1)

Piaget's Theory of Cognitive Development

Historically, the majority position of developmental theorists has been learning theory, although increasing attention has been devoted to cognitive developmental theories, as a result of Piaget's heuristic work. His theoretical essays and empirical research on development of basic cognitive skills in children have stimulated more recent socialization research in such areas as dependency, morality, and sex-role identification (Kohlberg, 1963; Kohlberg and Zigler, 1967; Turiel, 1966; Zigler, 1963).

There are several reasons for the emerging importance of cognitive-developmental theories. A primary reason is that these theories focus on the interaction of personal and environmental factors, while learning theories characteristically view behavior as a function of forces applied to the child. Two other theoretical traditions have also had influence on research in child development -- social anthropology and psychoanalysis. However, neither of these positions are developed to the point at which clearly testable propositions can be derived, and both approaches are incomplete in that they do not deal with many aspects of social behavior which are of interest to developmental researchers. (For a more complete discussion, see Zigler and Child, 1969).

In Piaget's theory, development is a function of qualitative changes in cognitive organization occur over the course of development from infancy to adulthood. Four major stages are posited including the sensorimotor stage (up to about two years old), preoperational stage (from two to about seven), concrete operational stage (seven to about eleven), and formal operations stage (eleven through adulthood).

Stages are defined in terms of the formal systems--primarily cognitive structures--the child is able to use in perceiving and dealing with the environment at different ages.

For Piaget, a cognitive structure is a pattern of action, not necessarily overt, which displays coherence and order. This definition has two important aspects. First, it implies that the child is an <u>active</u> agent, i.e., a cognitive structure is used to describe classes of children's psychological and behavioral activities. Second, it refers to the basic cognitive structure underlying the child's overt behavior, the bases of

his behavior. Piaget's stages provide concepts for roughly describing children's cognitive functioning, and the stages can be used as data points in analysis of behavior. However, the various structures he identifies are more significant, since they provide much more explicit theoretical bases for understanding children's thought processes and behavior than earlier, atheoretical normative studies (viz., normative and longitudinal research traditions).

In Piaget's theory, stages are differentiated in terms of a number of structures, but certain structures appear to be more important than others, at least in relation to our research. Two structures are of particular significance for distinguishing the preoperational stage from the concrete operational stages, the two stages characterizing most children in our research. The first is perceptual boundedness, the tendency for children to focus on and respond primarily to aspects of their immediate perceived environment. Pre-operational children are particularly characterized by perceptual boundedness. Piaget characterizes the mental processes of a child at this stage as a "mental experiment:" The child duplicates in mental imagery representations of the stimuli he receives. By contrast, the concrete operational child may not only duplicate what he sees, but also can manipulate mentally the elements in his perception. Thus, he is able to examine a number of possibilities in concrete situations, not simply accept what he perceives as the only reality.(2)

The second structure of special significance for differentiating those two stages is centration, the tendency to focus on a limited amount of the information available. The preoperational child tends to focus on one dimension of a situation, failing to make use of other dimensions which may be of equal relevance. Consequently, he has difficulty appreciating

the relations between two dimensions, and handling situations which require that two dimensions be dealt with simultaneously. The concrete operational child, on the other hand, is capable of decentration, i.e., he is able to focus on several dimensions of a situation or problem at the same time, and to relate the dimensions.

Several other structures, which are intimately related to perceptual boundedness and centration, also differentiate the preoperational and concrete operational stages. These other structures include the following: (1) egocentric communication, i.e., the inability to take the role of others in communicating to them; (2) syncretism, i.e., a tendency to link ideas and images into a confused whole; and (3) juxtaposition, i.e., a tendency to link events, one after the other, without seeing clear relationships among them, and an inability to understand either part-whole or ordinal relations. The thought of the preoperational child is characterized by each of these structures, but the concrete operational child has developed beyond them.

The close relationship of the various structures characterizing each stage is not surprising, since an important concept in Piaget's theory is organization, the tendency of the child to integrate structures into coherent and stable patterns. However, Piaget does not assume that the child's organization constitutes a <u>stable</u> equilibrium. Rather, he assumes that the child's cognitive structures tend toward a certain balance, but as new events occur which cannot be dealt with in terms of available structures, the child will develop new structures to cope with requirements of the new situation. With increasing experience, the child acquires more and different structures, and therefore adapts more easily to an increasing number of situations.

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Piaget's assumption of a dynamic equilibrium implies that growth is continuous and gradual. The child does not simply abandon a structure one day and replace it with a more advanced one the next. The assumption of dynamic equilibrium also implies that various structures characterizing a stage are not necessarily learned at the same time. Further, combined with the assumption that the child is an active agent, the dynamic equilibrium assumption implies that the structures which are learned, and the age at which they are learned, is dependent upon both experience and maturation. This point requires some elaboration.

Maturation and inheritance are central explanatory concepts in Piaget's theory, as concepts play in the theory is indicated by Piaget's assumption that the order of stages is invariant. This assumption supported by a great deal of data collected in a number of cultures. But the central role of experience in cognitive development is also supported by these same data, which indicate that various structures are learned at different ages in different cultures, and also within different subcultures in a single culture.(3)

To summarize briefly, Piaget's theory proposes that children develop through four major stages between infancy and adults. Each stage is characterized by a number of cognitive structures. The two stages of primary concern in this study, preoperational and concrete operational stages, are differentiated principally in terms of changes of two important cognitive structures--perceptual boundedness and centration.

The changes in cognitive structures from the preoperational stage to the concrete operational stage have a number of implications for children's information processing behavior. For example, in differentiating two stimuli, such as a television program and a television commercial, we would expect the preoperational child to focus on only a few dimensions (centration).

Furthermore, young children's perceptual boundedness would lead us to expect them to focus on perceptual aspects of stimuli, rather than message content. On the other hand, the concrete operational child should be able to focus on a larger number of dimensions (decentration), and he should be able to focus on the meaning of the messages, not simply on perceptual aspects.

As another example, in describing a complex stimulus such as a television commercial, we would expect the preoperational child to recall several images from the commercial, but have difficulty in relating the images in the proper sequence (syncretism and juxtaposition). On the other hand, we would expect the concrete operational child, who has progressed beyond these structures, to describe the stimulus in an appropriate sequence.

The structural changes have implications not only for how children process information, but also for how children select information. For example, we would expect that the preoperational child will exhibit less differentiation in his responses to a sequence of visual and auditory stimuli, such as a television program-commercial sequence, than a concrete operational child, since there should be decreasing perceptual boundedness and a shift from centration to decentration.

These general hypotheses regarding processing of information and selection of information guided the design of the studies reported here.

Design of the Studies.

Two sets of studies are reported here. We will refer to the two as the early studies and the later study. In the early studies, three types

of data were collected from mother-child pairs. Initially, a random sample of 15 women's service clubs in the Boston area was contacted. From each of these clubs, approximately equal numbers of mothers of 5-12 year-olds were randomly selected to participate in the study. The sample is skewed slightly toward the upper-middle class compared to SMSA data for Boston. This is largely a result of the socioeconomic status distribution of membership in this type of club. The median age of mothers was 33 years, and the median number of children per household was 3.

Of 100 mothers initially contacted, 90 finally agreed to participate. The first study focused on selection of information as indexed by children's attention to television programming and advertising. The data consisted of mother's unobtrusive observation of their children watching television in the home during normal viewing periods. A donation of $10 was made to the women's club for each observation record completed by a club member. The observational procedures used will be described in detail when data relevant to children's selection of information are presented.

The mothers were later interviewed concerning purchase influence attempts by children, and yielding to these attempts, providing the second type of data in the project. These findings are reported elsewhere (Ward and Wackman, 1972).

Approximately four months later, the mothers were again contacted for the purpose of arranging interviews with the child whose television behavior had been observed. Children were paid $5 for their participation. These personal interviews provide the third kind of data collected in the project and include data relevant to children's processing of information from commercials.

The final sample, for which all three kinds of data are available, numbered 67. Table 1 indicates that approximately equal numbers of children from each age group are included in the sample; however, there were more boys than girls.

The later study involved experimentally manipulating a series of commercials imbedded within a television program. Children's selection of information was again indexed by observing their attention behavior, and their processing of information was measured by asking them questions after they had viewed the program. The sample in this study consisted of 40 nursery school, kindergarten, and second graders from an upper-middle class suburban school district in St. Paul, Minnesota. Approximately equal numbers of boys and girls were included (Table 1). The study was conducted in the school.

Experimental manipulation of the commercials was carried out by selecting twelve commercials which differed in visual and auditory style, as measured by a coding system developed by Watt and Krull (1972).[4] The choice of the style variables in the commercial manipulation was made in order to test some inferences made from the early studies, as well as to test some further implications of Piaget's theory. Both of these will be discussed later in the paper.

To summarize briefly, both the early and late studies were conducted with a sample of children skewed toward the upper middle class. The early studies included children from 5 to 12 years old, and the later study included children from 4 to 8. In the early studies, data was collected in the home. Attention behavior data was collected by mothers, and interview data related to children's processing of information was

collected by pairs of interviewers. In the later study, attention behavior and interview data were collected in the school by observer-interviewers.

Children's Processing of Information from Commercials.

In the early study, interviews were conducted in the home by two interviewers; one conducted the interview, while the other transcribed the child's response. Pretesting had indicated that tape recorders inhibited children's responses; therefore, since complete recording of answers was necessary, the two interviewers were used. Interviews lasted an average of one hour. Transcripts were coded independently by two research assistants, and a small number of discrepancies were reconciled.

The initial questions in the interview attempted to determine the child's level of understanding of commercials. Respondents were asked, "What is a commercial?," and "What is the difference between a TV commercial and a TV program?"

We expected youngest children to exhibit characteristics of pre-operational thought in answering the question "what is a commercial?" That is, these children should rely primarily on perceptual cues in television stimuli, and rely on only one or a few attributes or dimensions in responding. Such responses constitute the "low level" category, i.e., "it's part of a show," "it interrupts the show," they show things," or a specific advertisement was identified. Children with a medium level of understanding appear to have the beginnings of a concept of advertising, saying "it tells people about things to buy," "it says good things about the thing they're showing," "it advertises things," etc. Finally, children with a high level of understanding rely less on perceptual cues and identify commercials in terms of

more complex and abstract dimensions, e.g., the persuasion motive, and in some cases, the concept of sponsorship.

As Table 2 indicates, nearly two-thirds of the 5-8 year olds exhibit a low level understanding of commercials, compared to only one in six of the 9-12 year olds, most of whom exhibit a medium level understanding, i.e., some notion of the concept "advertising." Only a few respondents indicate a high level of understanding of commercials.

Two levels of understanding of commercials are distinguishable from responses to the question concerning children's differentiation between commercials and programs. Low level differentiation responses are often based on recognition of different perceptual cues, e.g., "commercials are short and programs are long," "commercials usually come before or after the show," "programs are better," "lots of things happen in a program," "programs have more people than commercials."[5] In contrast, children exhibiting a higher level of differentiation indicate some understanding of the meaning of the message, giving responses such as: "shows have a story or moral," "commercials show products," "programs are supposed to entertain," "they got you to watch programs so you'll see commercials," "commercials try to sell things." Again, 5-8 year olds generally exhibit a low level of understanding, as Table 3 indicates. Nearly four of five younger children exhibit a low level of differentiation. In contrast, three-fourths of the older children exhibit a high level of differentiation.

In examining responses to questions concerning understanding of commercials and program-commercial differentiation, low level responses to both questions clearly indicate characteristics of preoperational stage thought--reliance on perceptual cues in particular and, to a lesser extent, centration. On the other hand, the higher level responses indicate less

dependency on perceptual cues and greater understanding of the meaning of the message--characteristics of concrete operational thought. As expected, level of understanding is related to age.

For the remainder of the analyses, a scale of cognitive level was constructed from responses to the two questions discussed above. The index was constructed since chronological age is simply a presumed correlate of cognitive level, which is the primary independent variable in Piagets' theory. While our index is a crude one at best, the questions were assumed to tap fundamental structural dimensions which would be associated with different cognitive levels. More direct tests of our general hypotheses could be obtained via analysis by cognitive level, rather than simply by age.

Three cognitive levels were distinguished. Low cognitive level children gave low level responses to both questions. Medium cognitive level children gave a medium or high level response to the first question and a low level response to the second, or vice versa. High cognitive level children gave a medium or high level response to the first question and a high level response to the second. Twenty of the children were classified as low cognitive level, 22 as medium, and 25 as high cognitive level.

Table 4 indicates a substantial relationship between age and cognitive level. However, over 50 percent of the younger children (5-8) are not categorized in the lowest cognitive level, the level most similar to preoperational stage thought. On the other hand, only two of the 34 younger children are at the high cognitive level, which presumably is highly related to concrete operational thought. Seventy percent of the older children (9-12) are at the high cognitive level, but 30 percent have not yet reached

high cognitive level in their understanding of commercials. Thus, although age is a very good predictor of cognitive level, not all of the younger children are preoperational in their thinking about commercials (indeed, a majority are not), and a substantial minority of the older children do not exhibit responses characteristic of the concrete operational stage. Fully one-third of the children are at a level between the two stages; we will refer to this level as a transitional stage in the remainder of the paper.[6]

Following the questions designed to measure children's understanding of what a commercial is, we attempted to gauge children's understanding of the purpose of commercials ("Why are commercials shown on TV?")

Again, we expected low cognitive level children to lack the ability to "take the role" of the advertiser and to discuss profit and selling motives in commercials. This is due to lack of information concerning the nature of advertising, and the "egocentric communication" characteristic of preoperational children. The three-level distribution of responses to the question appears to confirm our expectations.

Children exhibiting a low level of understanding have little awareness of selling motives of commercials, and no understanding of profit motives. They give answers such as: "to show you things," "to let people know things they can buy," "to help people," "to tell you where you can buy things," "so actors can make money." Children exhibiting medium understanding indicate recognition of the selling motive, but little awareness of profit motives; e.g., "to make people buy things," "to sell products." Children with "high" understanding are aware of both selling and profit motives, and some appear to be aware of the sponsorship concept; e.g., "to make money," "to get you to buy one product, and not others," "they pay for the show."

Nearly one-half of the children exhibit little understanding of the purpose of commercials, including three-fourths of the low cognitive level children compared to only one in five of the high cognitive level children (Table 5). On the other hand, over one-fourth of the high cognitive level children understand the selling and profit motives, whereas none of the low cognitive level children understand these concepts. Apparently, the low cognitive level children are not able to understand the motives behind commercials very well, but medium and high cognitive level children are more aware of these motives.

This finding is in line with Flavell's (1963) results which indicate that young children were unable to take the role of the other in a series of role-taking tasks. In Flavell's experiments, young children showed little ability in taking the perspective of the experimenter on tasks ranging from describing designs from the experimenter's position (which differed from the child's), to describing how to move from one point to another on a map, to assessing other's intentions in a situation. Thus, it may be that low cognitive level children cannot abandon their own perspective and take the perspective of the advertiser when viewing commercials.

The next set of questions was designed to measure children's ability to process a complex stimulus, a TV commercial. We asked them to indicate their favorite commercial, and also to describe the one that they "really don't like--the one you don't like the most." After they had identified a liked or disliked commercial, we asked them to "tell me what happens in this commercial."

Three levels of complexity of recall of the commercial are distinguishable, following closely Piaget's description of changes in

cognitive structures from the preoperational to concrete operational st . Low complexity children recall one or two images, but their responses indicate no unified recall of the commercial message e.g., "there was a man on a horse," "there were two hands covered with gook." Medium complexity children recall several images, but the images are randomly related. Their answers indicate no unified recall of the message; the sequence and conclusion of the ad are not clearly stated. High complexity children recall multiple images too, but describe the sequence of images in a coherent fashion, and clearly state the conclusion.

Again, level of complexity of recall is strongly related to cognitive level, as Table 6 indicates.[7] Over one-half of the high cognitive level children exhibit high complexity of recall, compared to only one-fifth of the low cognitive level, and two-fifths of the medium cognitive level children.[8] Responses to this question perhaps provide a more direct test of implications of Piaget's theory for understanding children's information processing than did the question concerning children's understanding of the purpose of commercials. But in both instances, the data strongly support the general hypothesis derived from the theory.

Finally, to further examine children's understanding of commercials and their purpose, we asked the following set of questions: "Do TV commercials always tell the truth?;" "How do you know they (don't) tell the truth?" "Why do (don't) they tell the truth?"

A majority of the children think commercials definitely do not always tell the truth, as Table 7 indicates, and a third think commercials "sometimes" don't tell the truth. Only among high cognitive level children is there a clear majority (80 percent) who think commercials definitely do not always tell the truth. Approximately two-fifths of both the low and

medium cognitive level children think commercials "sometimes" don't tell the truth, and nearly a third of the low cognitive level children think commercials do tell the truth all the time.

Responses to the follow-up questions are more interesting for theoretical purposes. We would expect low cognitive level children to focus on perceptual aspects of message stimuli as the basis for their reasoning, while higher cognitive level children would be expected to explain their reasoning in terms of more complex criteria, which may go beyond the cues actually perceived in commercial messages. Analysis of the data support these expectations. Answers to the question, "How do you know commercials (don't) tell the truth?", fall into two categories. Perceptual reasons focus upon things the child could see in the commercial in relation to aspects of the message of the product. For example, children who don't think commercials always tell the truth, and who give perceptual reasons to justify their answer, say such things as, "people in commercials aren't real," "people don't really walk out of walls," "I don't see things in the store." And children who think commercials do tell the truth and give perceptual reasons express reasons such as: "I know they're true because I see these things in the store," "sometimes I see things I wanted." Reality-test reasons focus upon several different ways the child may have tested the truth of commercials, e.g., "things don't always work the way they do on TV," "I bought the car and it didn't work right," "I asked my Mom and she told me so," "they just want you to buy the product."

Nearly three of five low cognitive level children give perceptual responses as a basis for judging the truthfulness of commercials, compared to 30 percent of the medium level and 12 percent of the high cognitive level children (see Table 8).

On the other hand, 50 percent of the medium and 84 percent of the high cognitive level children give reality-test responses. Nearly a fifth of both low and medium cognitive level children don't know how to tell if commercials tell the truth. This result is clearly consistent with Piaget's theoretical description of the perceptual "literalness" of the preoperational child, who is similar to the low cognitive level child in the present study. According to Piaget, what the preoperational child perceives is what is true for him, and this tendency is reflected in the reasons low cognitive level children give for judging commercials truthfulness.

Differences between preoperational children and concrete operational children can also be seen in responses to a question, "Why do (don't) TV commercials tell the truth?" Preoperational children would be expected to have difficulty assuming the advertiser's role, while concrete operational children should be able to identify selling motives as a basis for their reasoning.

Consistent with these expectations, two categories of responses were distinguished: Trusting responses indicate the child does not question the motives of commercials. Examples of these responses are "they don't know if it works," "they are trying to be funny," "it's a mistake," "they want to help people," "they don't want to lie." Selling motive responses indicate understanding of this motive of commercials, although several children who thought commercials always tell the truth also acknowledged the selling motive in their response, e.g., "they want you to buy their product, so they wouldn't lie to you." Examples of distrusting responses are, "they want you to think their product is good," "they want you to buy their product," "so they can make money," "to make you buy one brand and not others."

As Table 9 indicates, about one-third of the low and medium cognitive level children give trusting responses, but only 19 percent of the low cognitive children give selling motive responses, compared to 47 percent of the medium cognitive level children. Further, 43 percent of the low cognitive level children answered "don't know," indicating a clear inability to take the role of the adversion on the other hand, all of the high cognitive level children give selling motive responses. The extremely large differences in responses to this question are clearly consistent with Piaget's discussion of differences between preoperational and concrete operational children's cognitive structures, and with Flavell's (1968) experiments on development of role-taking skills, noted above.

Children's Information Processing--The Later Study.

In the early study, children's responses to the various questions were highly consistent with Piaget's theory. However, two alternative explanations might be advanced for these results. First, since the high cognitive level children are older and thus have had more exposure to commercials, the results may simply be due to their greater familiarity with TV commercials.[9] However, cognitive level predicts a number of the children's responses better than age, providing some support for the validity of Piaget's theoretical position. Second, since older, high cognitive children have better memories, some of the results (e.g., complexity of recall of commercials) may simply be due to their ability to remember more about various commercials. This alternative was examined in the later study.

In this study, pairs of children first viewed a one-half hour television show which included 12 commercials differing in visual and auditory style. During the show, children's attention behavior was recorded by an observer (see below for a description of the coding scheme used). After the show, children were interviewed individually and asked which commercials they remembered from the show, and what they remembered about the commercials. They were then shown the first seven commercials again; after each commercial, the children were asked whether they liked or disliked the commercials, and why.

Therefore, in this later study, children's recall of commercials was measured within one-half hour of exposure to the commercial, and their affective responses were measured within seconds of exposure. Consequently, the time lapse from exposure to questioning was much shorter and better controlled in this study as compared to the earlier study. In that study, children were asked about their most favorite and least favorite commercials, exposure to which may have occurred considerably before the questioning. Thus, if results in this study replicate those in the earlier study, it is less likely that the results are simply due to the better memory of the older children.

During the interview, children were also asked a series of questions designed to measure perceptual boundedness.[10] Although older children were somewhat less perceptually oriented in their responses, the perceptual boundedness measure did not form a particularly good scale for several reasons. First, since the age range dealt with in this study is from 3 to 8 years old, the great majority of children would be expected to fall in the preoperational stage; the data indicated that 83 children were in this stage, compared to 26 in a transitional stage and 4 in the concrete

operational stage. (Seven children did not answer these questions.) Thus, it would appear that the measure indexes gross cognitive stage, but is not very sensitive to finer discriminations of sub-stages. Second, the distribution of kindergarteners was quite different than the distribution in the early study. In that study, 8 of the 17 five and six year olds were classified as transitional or higher (Table 4); in the present study, only 7 of 40 kindergartners were classified as transitional or higher. This suggests that possibly responses of the kindergartners were somewhat unreliable in the later study. Therefore, analyses of data in this study compare children of different ages, rather than measured cognitive level. Since age and stage are generally highly correlated, this procedure is one that is commonly used in studies of cognitive development.

In the interview, children were first asked whether they remembered any of the commercials, and if so, what had happened in the commercial. As Table 10 indicates, only four of the nursery school children remembered any of the commercials, compared to 22 kindergartners, and 28 second graders. This result may be partly due to fatigue among the nursery schoolers, but the extremely large differences would suggest that the older children have better memories for what they have seen than the nursery school children. Nursery school children are dropped from further analysis of the recall data because of the limited number answering.

Responses to the first commercial recalled were coded in terms of the complexity of recall, using the same coding procedure as was applied in the early study. Ninety-one percent of the kindergartners had a low level complexity in their recall of the commercial, compared to about 29 percent of the second graders. On the other hand, 57 percent of the second graders had medium level complexity, and 14 percent had high level complexity. These data in Table 11 are very similar to data in the early study, shown in Table 6.

Second grade responses were more elaborated than the kinder[illegible] responses; therefore, it is possible that the greater complexity of their recall may simply be a function of their greater verbal ability. To test this, a score was developed which controlled for the number of statements the child made. This score is the number of conceptual attributes (i.e., statement regarding the function of the commercial) divided by the total number of attributes mentioned by the child. Data presented in Table 12 clearly indicate that second graders are more likely to give conceptual responses than kindergarten children. Only one of the kindergartners gave any conceptual responses, compared to 13 of the 28 second graders.

Both of these results indicate that second graders have greater complexity in their recall of commercials and that their responses show a higher level of understanding of the purpose or function of commercials.

At the end of the interview, children were shown the first seven commercials from the show for a second time. After each commercial, the child was asked whether he liked or disliked the commercial, and why. The children's responses were analyzed in terms of whether perceptual or conceptual reasons were given for their evaluation of the commercial. Perceptual reasons were references to objects or images shown in the commercial; conceptual reasons were references to how well the commercial was fulfilling its function. Table 13 indicates that nursery school children almost never gave conceptual reasons, and only a few kindergarteners gave conceptual reasons. On the other hand, a number of second graders gave conceptual reasons for their evaluations of each of the seven commercials; in fact, over half of the second graders gave a conceptual reason for their evaluation of the first commercial. Again, these results clearly indicate a higher level understanding of the purpose or function of commercials by second graders.

Summary of Information Processing Studies.

Responses to the various questions in both studies are highly consistent with Piaget's theoretical discussion regarding differences in the cognitive structures of preoperational and concrete operational children. In general, younger, low cognitive level children, who are similar to Piaget's preoperational child, give responses which clearly indicate the operation of tendencies to focus on only a few dimensions (centration), dimensions which are largely perceptual in nature (high perceptual boundedness). On the other hand, older, higher cognitive level children, who are most similar to Piaget's concrete operational child, respond in terms of more dimensions (decentration), and the dimensions they focus on tend to be less perceptual and more symbolic in nature (low perceptual boundedness).

Responses of children classified as medium cognitive level are most interesting in some respects. Their responses to some questions indicate a greater similarity to low than to high cognitive level children, e.g., "why do (don't) commercials tell the truth?" (Table 9). But their answers to other questions indicate just the reverse--a greater similarity to high cognitive level children, e.g., "complexity of recall of commercials." (Table 6). These results are consistent with Piaget's theoretical position in two ways. First, Piaget emphasizes that development is continuous, i.e., children don't jump from one stage to another, but rather their development is gradual as they learn new structures. Second, Piaget emphasizes that in moving to a higher stage of cognitive development, the child does not necessarily learn all the structures at the same time. Thus, for example,

a medium level child may decrease in perceptual boundedness, but still maintain the centration structure.

The results in the two studies, then, are highly consistent with a number of aspects of Piaget's theoretical position.

Children's Selection of Information.

The design of the studies of children's selection of information was also guided by Piaget's theory. Two quite contrasting hypotheses were developed and tested in the two studies. In the early study, the general hypothesis tested was the following: The preoperational child will exhibit less differentiation in his attention to varied television stimuli than the concrete operational child. The rationale for this hypothesis is based upon this reasoning. Preoperational children are more perceptually bounded and tend to centrate on only a few perceptual dimensions of stimuli. Television programs and commercials are, on the whole, quite similar perceptually, (i.e., in their manner of visual and auditory presentation) though they differ considerably in their message (i.e., content).[11] Thus, we would expect the preoperational child, who is likely to be sensitive largely to perceptual aspects of stimuli, to be more stable in his attention to varied television content than the concrete operational child, who is likely to be sensitive to content aspects of messages as well as perceptual aspects.

In the later study, a contrasting hypothesis was tested: The preoperational child will exhibit greater differentiation in his attention to television commercials which differ mainly in terms of perceptual aspects--visual and auditory style. The rationale for this contrasting hypothesis is

based upon both similar and different assumptions. One similar assumption is that preoperational children are more perceptually bounded and tend to centrate on only a few perceptual dimensions. However, the second assumption is different, namely, that if stimuli (television commercials) are varied only in perceptual aspects, and not in content, the preoperational child will exhibit more variation in his attention since he is likely to be more sensitive to perceptual aspects of messages than the concrete operational child.

Our index of information selection in both studies is the attention behavior of the child. Attention to a stimulus is a necessary condition for selecting information from the stimulus, and for subsequent processing of the information. However, simply measuring a child's attention to a stimulus indicates little concerning what information he selects from the stimulus.

Much research on children's attention has focused on stimulus selection--what aspects of stimuli are attended to and what aspects are ignored. Berlyne (1960) suggests that stimulus novelty, complexity, and surprisingness are important stimulus properties influencing attention. More recent research suggests that children's attention is particularly influenced by stimulus complexity (Munsinger and Kessen, 1964), though the "optimal" complexity level depends upon the child's information processing abilities. Repetition, size, and contrast of stimuli have also been related to children's attention (Kagan and Kogan, 1970).

In these studies, stimulus selection is most often measured in the laboratory in terms of pupil dilation and eye movements. Little research has examined children's responses to complex audio-visual stimuli, such as television programs or commercials, although research used in

designing [illegible] to examine children's attention to television laboratory situations, and related attention behavior to learning outcomes (Lesser, 1972). However, measurement of stimulus selection in the natural home environment is very difficult.

While gross measures of attention behavior provide little precise data concerning the exact stimulus cues children select, these measures can provide useful data concerning children's selection of gross segments of audio-visual information. By observing changes in children's pattern of attention, we are at least able to draw inferences about discrimination of different cues in the stimulus and in the viewing context.

There have been two types of measures used in studies of attention to television among children and adults in the home environment. Steiner (1966), Ward Robertson, and Wackman (1971) and Murray (1972) used in-home observers to unobtrusively record attention to commercial and programming sequences among adults or children. Allen (1965) and Bechtel, Achelpohl, and Akers (1972) used mechanical devices (cameras adjacent, or attached to the TV set) to provide continuous surveillance of audience behavior during viewing in the home environment.

In general, these studies show that both adults and children exhibit a decrease in attention from programming to commercials (Allen, 1965; Bechtel et al, 1972; Ward et al, 1971).

The Early Study.

Most previous research has not focused on patterns of children's attention to commercials. Consequently, the objective of the early study was to examine children's attention to commercial sequences (i.e., "blocks" of up to six commercials which occur sequentially either during programming, or between programs).

As stated above, Piaget's theory leads us to expect preoperational children will exhibit less differentiation in responses to varied television content than will concrete operational children. Consequently, our working hypothesis was that low cognitive level children will exhibit more stability in their attention than other children, and high cognitive level children will exhibit the most differentiation. We also expected, based on previous research, that children will attend less to commercials than to programs, but that low cognitive children will "tune out" least. Finally, we expected that attention would decrease throughout commercial sequences.

To measure attention behavior in the present study, mothers were rigorously trained in the use of observation sheets in small group meetings. The mothers observed research assistants role play children's television watching in ways that permitted illustration of all various coding categories. The mothers practice coded, and their coding was checked.

The degree of attention was measured according to the following three-point scale:

1. Full attention-stays in viewing position and watches all or almost all; eyes on set;
2. Partial attention-stays in viewing position but does not pay full attention (turns around, talks, etc.); eyes on and off set.
3. No attention-stays in room but completely occupied with other activities; leaves room; not in room at onset.

Children's attention prior to, at onset, and during each commercial were coded.

In a departure from previous studies, times during which mothers would actually observe their child watching television were controlled. Mothers completed viewing logs for the child to be observed, which indicated programs and times when the child was likely to watch in a given week. Specific times for observation and coding were sampled from these logs in order to represent the child's normal viewing times during the week in which observations would take place. Mothers were instructed to code a minimum of 3 viewing hours, to a maximum of six, depending on the amount of TV watching by the particular child. Assigning times for observation enabled us to approximate the normal viewing behavior of the child, as well as avoid selection of observation times by mothers. Mothers practiced coding for at least one half-hour before actual observations began. They they observed the child for one week; days during which observations were to begin were randomized.

Every 10th commercial sequence that the child watched was coded and keypunched, resulting in a sample of 526 commercial sequences watched by the 67 children, an average of 8 sequences per child (Table 14). Of the total sequences coded, one-fifth consisted of only one commercial, 36 percent consisted of two commercials, and 24 percent consisted of three commercials.

For the first commercial in a sequence, full attention occurred about half the time, but decreased for later commercials falling to a level of 29 percent full attention for the 4th commercial (Table 15). One-fifth of the children paid partial attention to each commercial position in the sequence. No attention increased from 30 percent for the first commercial in the sequence to over 50 percent for commercials in the fourth position. Thus, as expected, attention decreased throughout the commercial sequence.

To test the general hypothesis based on Piaget's theory--that preoperational children will exhibit less differentiation in their responses to varied television content than will concrete operational children-a variety of comparisons of changes in attention behavior were made. In each of these comparisons, the expectation was that the percentage of full attention responses by low cognitive level children would be more stable than the percentage for medium or high cognitive level children. We also expected that high cognitive level children would have the least stable percentage of full attention.

The first comparison, shown in Figure 1, is between full attention to program and to the first commercial in a sequence. The percentage full attention to the program is 58% among low cognitive level children, and this decreases by two percent for the first commercial. Medium cognitive level children's percentage decreased 18 percent, from 62 percent full attention to the program to 44 percent full attention to the first commercial; high cognitive level children's percentage decreased 23 percent, from 70 percent for the program to 47 percent for the first commercial. Thus, as predicted, low cognitive level children's responses to the program-commercial transition is more stable than either medium or high cognitive level children; the latter group show the greatest differentiation in their attention to the program and first commercial.

The next comparison, shown in Figure 2, is between full attention to commercials which occur in the middle of programs and those at the beginning or end.[9] Our purpose in this comparison was to see if commercial placement relative to programming differentially affects attention responses of various cognitive level children. Percentage full attention to commercials at the beginning or end of the program is 38 percent among low cognitive level children, compared to 47 percent full attention for commercials in the middle of the program, a difference of nine percent. The difference

for medium cognitive level children is 11 percent (34 percent for beginning or end commercials and 45 percent for middle commercials), and 21 percent for high cognitive level children (60 percent for beginning or end commercials compared to 39 percent for middle commercials). Again, low cognitive level children exhibit the most stability in their attention behavior, and high cognitive level children exhibit the greatest differentiation.

The third comparison concerns full attention to commercials for different types of products--toys or games, food or soft drinks, personal products such as toothpaste and cosmetics, and all other products. As Figure 3 indicates, except for toy and game commercials, percentage full attention for low cognitive level children is quite stable, ranging from 47 percent for food and soft drink commercials to 37 percent for commercials about other products, a range of 10 percent. The range among medium cognitive level children is 18 percent from a high of 56 percent to a low of 38 percent. Among high cognitive level children, the range is 23 percent with a high of 51 percent and a low of 28 percent. Again, the results indicate the greater attention behavior stability of the low cognitive level children, compared to the medium and high cognitive level children.

Low cognitive level children do deviate considerably from their average attention behavior when toy or game commercials come on the air. This indicates that their attention behavior is not entirely stable, as the other data discussed so far suggest. However, it may be that low cognitive level children increase attention only when highly salient content cues (such as toys or games) are included in the commercial.

The comparisons so far have involved attentional differences among television stimuli, i.e., program-commercial, position in program, or type of product advertised in the commercial. The next comparison involves differences in the context of viewing, i.e., the time of the week when the commercial occurs. Three viewing times were distinguished for analytic purposes, early weekday evenings, Saturday mornings, and other times. Generally, our data indicate that the social context of viewing differs at these different times. Early evenings are characteristically a total family viewing time, whereas Saturday morning is generally restricted to child viewing; viewing at other times shows no single characteristic pattern.

Figure 4 indicates that the differentiation of attention behavior in terms of contextual cues is greatest among high cognitive level children: their full attention to commercials ranges from 75 percent on Saturday mornings to a low of 27 percent full attention to early weekday evening commercials. The range for medium cognitive level children is 17 percent; for low cognitive level children, the range is only four percent. Thus, low cognitive level children exhibit a high degree of stability when contextual cues vary, just as they do when stimulus cues vary.

The final comparison controlled the television content cues (to some extent) and varied the contextual cues. This was done by comparing children's attention to food or soft drink commercials at two different times--Saturday mornings and other times. Low cognitive level children again exhibit a high degree of stability in their attention behavior, with a range of only 8 percent (Figure 5). The range of full attention for medium cognitive children is 31 percent, and high cognitive level children have a range of 40 percent.

The set of comparisons of attention to different stimuli are highly consistent in indicating the high degree of stability of low cognitive level children in their attention behavior, and the high degree of differentiation in attention behavior of high cognitive level children. Medium cognitive level children fall between low and high cognitive level in every comparison, although generally, their range is closer to that of the high cognitive level children. These data provide impressive, and relatively direct, support for the general hypothesis derived from Piaget--that low cognitive level children will exhibit less differentiation in their responses to varied stimuli than will concrete operational children.

The Later Study.

In the later study, a contrasting hypothesis derived from Piaget was tested: The preoperational child will exhibit greater differentiation in his attention to television commercials which differ mainly in terms of perceptual aspects--visual and auditory style. The rationale for this hypothesis was presented above.

In the study, 12 commercials were imbedded in a one-half hour situation comedy show. Four commercials, constituting the first block, were commercials thought to be irrelevant to young children (i.e., Clark and Skelly gasoline, Bromo Seltzer, and Clorets). The second block consisted of three relevant commercials (i.e., Burger King, Hershey's Instant, and Gatorade). Commercials in both of these blocks were chosen because they represented the extremes on one or both dimensions of the style variables--visual complexity or of auditory complexity. The last block of five relevant (food) commercials were selected because they represented midpoints on one or both style dimensions. Since the first two blocks contain the

commercials at extreme points on both dimensions of the complexity measures, only data from these 2½ blocks are reported in the present study. Table 1 presents the visual and auditory complexity scores for each commercial. It should be noted that, although their was an attempt made to control the content of the commercials (e.g., all relevant commercials in the second and third blocks were food commercials), commercial content was not controlled to the extreme of using the same product in each commercial. Such a procedure would have been unnatural to the children, since children know that commercials for the same product are not shown three or four consecutive times on regular television.

Four different versions of the program were developed; the only difference between versions was in the ordering of commercials within blocks. Commercial blocks were not rotated; this precludes analysis of differences in attention to relevant and irrelevant commercials because of fatigue factors and differential attention span of the children.

Children viewed the program in pairs. One observer coded the attention behavior of each child. Reliability checks on a subsample of the children indicated intercoder reliability of 90.6 percent. Observers coded children's attention at the following times: prior to the commercial, at commercial onset, and at 10-second intervals during the commercial. The same three-point scale used in the early study was applied in this study--full, partial, and no attention.

For the first analysis, attention scores were developed by averaging the child's attention behavior for each observation within a single commercial. Thus, for the first irrelevant commercial block, each child has four attention scores, one for each of the four commercials in the block.

A repeated measures analysis of variance of attention to irrelevant commercials indicated the following: Age and style of commercial had

statistically significant main effects, but the interaction between style and age was not statistically significant. (Table 17) Since the interaction effect is the comparison that bears directly on the hypothesis, we must conclude that the hypothesis is not supported by the data. However, as predicted, nursery school children did differ most in their attention to high visual, high auditory versus the low visual, low auditory commercial. The mean difference score for attention to these commercials was .21, compared to .14 for kindergarten children and .03 for second graders. Table 18 indicates the mean attention scores for the two main effects, age and style.

The analysis of variance of attention to relevant commercials is presented in Table 19. Again, age and style of commercial had statistically significant main effects, but this time, the interaction of age and style was also statistically significant. Further, Table 20 indicates that the high visual, high auditory versus low visual, low auditory difference was as predicted. The mean difference score for attention to these commercials was highest for nursery schoolers at .26. There was little difference between kindergartners (.03) and second graders (.10). Therefore, data for the relevant commercials do support the hypothesis that younger children will exhibit greater differentiation in their attention to commercials differing largely in stylistic, perceptual aspects. Table 21 presents the mean attention scores for the two main effects, age and style.

Inspection of the data in Tables 18 and 21 seemed to indicate that the auditory complexity dimension was the more important style dimension. Consequently we regrouped the data for the irrelevant commercials in order to compare high and low auditory and high and low visual commercials separately. (Table 22). The mean attention scores of all children was .13

higher for high auditory than for low auditory commercials; however, mean attention scores were the same for both high and low visual commercials. Thus, it appears that variation in auditory complexity has a larger effect on attention behavior than variation in the visual complexity of the commercials.

In summary, then, the data yield mixed support for the hypothesis. For the irrelevant commercials, the age x stimulus complexity interaction, which bears directly on the hypothesis, does not reach statistical significance, although the differences in attention do decline in the predicted manner.

Explanation of these mixed results is made difficult by the fact that the experimental design confounds product category with placement of the blocks within the program, i.e., irrelevant-product commercials were always the first block within the program. Inspection of the sum of squares columns in Tables 17 and 19 indicates that there was a larger standard error in the first block of commercials. This could have occurred because the children had not become accustomed to the experimental environment by the time of the first block of commercials. Thus the variance in this block could have been increased by frequent shifts in attention due to simultaneous interest in the television and other aspects of the environment. By the second block the children's attention may have stabilized either on the television or some other feature of the environment resulting in the smaller standard error and clearcut stimulus complexity effect.

One facet of the data which bears on this issue is the stability of the subjects' attention from one observation to the next within each commercial. If factors other than the interest value of the commercial

were influential, then it is to be expected that stability within the commercials would be less than if such factors were not influential. Table 23 presents the percentage of stable transitions for the irrelevant and relevant product blocks. A stable transition occurs when the subject's attention level does not change from one observation to the next, while an unstable transition occurs when the attention level does change. The N's indicate the total number of observations recorded for each of the age groups.

This table indicates that there was noticeably greater stability in the relevant commercial block for both nursery schoolers and second graders (an 8% increase from irrelevant to relevant commercial block). While the kindergarteners showed no change, it is apparent that they were already quite stable (92% stable transitions). The stability data thus suggest that attention behavior during the first block may have been sufficiently unstable as to make a test of the hypothesis rather difficult for the irrelevant commercials.

The data also indicate that, as would be expected, nursery school children are less stable generally in their attention than kindergarteners or second graders. Clearly, the younger children have a shorter attention span than the older children. Data from Sesame Street research (1973) indicates that the average uninterrupted viewing of a Sesame Street show by 3 and 4 year olds, when a distractor is provided, is about one minute. Therefore, we might expect that the nursery schoolers would have difficulty maintaining full attention throughout the two-minute commercial blocks. However, the data also indicate that stimulus characteristics are important in determining attention, since in both blocks, nursery schoolers (as well as the older children) paid more attention to the high visual, high auditory complexity commercials.

Another test of the hypothesis of the study is provided by observing the changes in attention behavior of the children during shifts from program to commercials and vice versa. Data presented in Figure 6 shows the number of children in each age group with full attention just prior to a shift from program to commercial or vice versa, at the onset of the program or commercial, and 10-seconds after the program or commercial. Data for the shifts to and from the commercials in the first two blocks is shown. These data indicate that all of the children are aware of shifts between program and commercials. Thus, it is clear that children as young as 3-years are aware of the visual and auditory cues signifying the interruption of the program by a series of commercials.

To test the hypothesis that younger children will exhibit greater differentiation in their attention to stimuli varying mainly in terms of perceptual aspects, an attention change measure was developed. This measure is the sum of the changes in attention from one observation to the next among the 12 observations depicted in Figure 6. An analysis of variance with age as the independent variable was highly significant statistically. (Table 24). As the table also indicates, nursery school children changed considerably more in their attention from observation to observation than the kindergarteners or second graders, who were about the same. It is unlikely that these greater changes are due to the shorter attention span of the nursery schoolers, since the segments involved in the analysis were only 20 to 25 seconds in length, less than one-half the average attention span of 3 and 4-year olds found in the Sesame Street research. Rather, the data would seem to support the present hypothesis that younger, low cognitive level children are more sensitive to the perceptual changes involved in shifting from program to commercial, and vice versa.

One additional analysis was carried out. This analysis was designed to follow-up the previous analysis which had indicated that the auditory complexity dimension had a greater effect on differences in attention behavior than the visual complexity dimension. Two sets of "attention profiles" were developed, one for the four high auditory complexity commercials and the second for the three low auditory commercials. As Figure 7 indicates, more children shifted toward full attention at the onset of high auditory complexity commercials than did so at the onset of low auditory complexity commercials. Also, for high auditory commercials, the decline in attention is more gradual than for the low auditory commercials. It should be noted that the auditory dimension is not a measure of loudness; rather, the dimension is essentially a measure of the randomness of patterning of music, verbalizations, and segments of silence in the commercial.

Simon (1972) has argued that children learn to process auditory stimuli more readily than visual stimuli, as indicated by the fact the children learn to talk much earlier and more easily than they learn to read. It well may be that the greater effect of the auditory dimension on attention behavior in the present study is due to this kind of developmental difference.

Summary of Selection of Information Studies.

In both studies, the hypotheses derived from Piaget's theory were reasonably well supported. In the early study, a number of comparisons indicated that low cognitive level children's attention behavior had greater stability than the attention behavior of high cognitive level children when television content and viewing context were varied. Thus, as predicted,

when stimuli vary mainly in non-perceptual, content aspects, higher cognitive level children exhibit greater differences in their attention behavior. On the other hand, as the later study showed, when television stimuli vary mainly in perceptual aspects, younger, low cognitive level children exhibit greater differentiation in their attention behavior. In most respects, the data was quite consistent, indicating that Piaget's development theory has clear implications for the analysis of children's selection of information. Apparently differences in the cognitive structures of children at different stages of cognitive development have an impact on how they attend to stimuli.

A methodological implication from these studies, especially the later study, is that attention behavior of children is relatively unstable. Thus, the researcher would be well advised to take rather short observational units, certainly less than the entire commercial that was used in the first study, and possibly less than the 10-second interval used in the later study. It may be that the best solution would be to use continuous coding, although this might prove to be difficult and rather obtrusive in non-laboratory situations.

Discussion

Although data from both the early and later studies consistently support the general hypotheses guiding the studies reported here, there is an important limitation. Sample sizes in the present studies was small, and it was somewhat non-random in nature, although in the early study attempts were made to randomize in the selection of women's service clubs in the Boston area and in the random selection of mothers within these clubs. Nevertheless, in both studies, the sample was skewed toward the upper middle class.

The small sample limitation, however, is mitigated somewhat by the high degree of consistency in the results. Data in the information processing studies uniformly supported the hypotheses, and in all cases, the result was highly significant in a statistical sense. Data in the information selection studies also were quite consistent in supporting the hypotheses. In the early study, differences among the three cognitive levels were large, although statistical tests were not performed because of the dependencies in the data. In the later study, differences were generally as predicted and statistically significant. The high degree of consistency of the results is, however, a major strength of the studies.

The second major strength of the studies is that two very different kinds of data, collected with several different methodologies, were used to test the hypotheses, and the two sources of data were consistently supportive. While the studies are not a precise application of the multi-trait, multi-method research (Campbell and Fiske, 1959), they nevertheless represent an application of the general principle of using multiple methods to test the same proposition. In this case, the broad theoretical proposition was that children's information selection and processing is influenced by their cognitive development.

The third major strength is that, in several instances, the same specific hypothesis was tested in several different ways. For example, in the early information selection study, five comparisons were made to test the same proposition. As Stinchcombe (1968) points out, such a procedure increases our confidence in the validity of the proposition if the results are consistent, as they are in the present studies.

Thus, although the small sample size in the present studies imposes important limitations, the consistency of results, the use of different methodologies, and the multiple tests of specific hypotheses are major strengths of the studies.

Also of significance is the fact that the two studies are based upon a comprehensive theoretical position concerning psychological development--Piaget's theory. The theory and data presented here are intended to illustrate the utility of theoretical explanation for research which is also highly important for immediate social policy decisions. These data have been useful in formulating policy decisionsrregarding advertising practices affecting children (Ward, 1971). The theoretical bases of the data are useful in order to link the particular results with a much broader area of research--in this case, the results fit into a much larger pattern of research generated within the cognitive-developmental tradition. Secondly, the theory provides explanation of why differences occur in children's processing and selection of information. This explanation, of course, is based on the changes in cognitive structure which occur as the child develops. The concept of age, on the other hand, provides no theoretical explanation for the results.

Finally, it should be noted that the studies reported here are only two from a larger series of studies of children's consumer learning. In these studies, we have taken the view that consumer behavior, and therefore consumer learning, is in large part a matter of information gathering and information processing. Therefore, effective consumer behavior, which will maximize the consumer's ability to achieve his own goals as a consumer, requires that the consumer knows a good deal about possible sources of

information, the kinds of information different sources have, the kinds of information he needs to make decisions, and how to process the information he has collected when he is ready to make a decision. Our research on children's consumer learning is focusing on how much different children know about these kinds of things, and how they learn what they do learn. Results from these studies clearly indicate what is learned increases with age. Part of this increase is certainly due to the larger range of experience of the older children, but part of it is also due to changes in cognitive development. In short, then, it is clear that conceptualizations of consumer learning or consumer socialization must be development. Not only what is learned, but how learning occurs, is different for children of different ages, and conceptualizations of development must reflect and account for these differences.

Table 1. Characteristics of the Samples.

Early study.

Age	n	%	Sex	n	%
5- 6	17	25			
7- 8	17	25	Male	39	58
9-10	13	20			
11-12	20	30	Female	28	42
Total	67	100%	Total	67	100%

Later study.

Grade	n	%	Sex	n	%
Nursery	40	33	Male	58	48
Kindergarten	40	33			
Secondary	40	33	Female	62	52
Total	120	100%	Total	120	100%

Table 2. Awareness of "What a Commercial Is" by Age.[4]

		Age		
		5-8	9-12	Total
Level	Low	63%	16%	39%
of	Medium	34	75	55
Awareness	High	3	9	6
		100%	100%	100%
	n.	(32)	(32)	(64)

$x^2 = 12.86$, 1 df., p .001

Table 3. Program-Commercial Differentiation by Age.

		Age		
		5-8	9-12	Total
Level of Differentiation	Low	79%	27%	54%
	High	21	73	46
		100%	100%	100%
	n.	(34)	(33)	(67)

$x^2 = 16.27$, 1 df., $p < .001$

Table 4. Cognitive Level by Age.

		Age				
		5-6	7-8	9-10	11-12	Total
Cognitive Level	Low	53%	41%	23%	5%	30%
	Medium	41	53	23	15	33
	High	6	6	54	80	37
		100%	100%	100%	100%	100%
	n.	(17)	(17)	(13)	(20)	(67)

$x^2 = 29.78$, 2 df., $p < 001$

Table 5. Understanding of the Purpose of Commercials by Cognitive Level.

		Cognitive Level			
		Low	Medium	High	Total
Level	Low	75%	50%	20%	47%
of	Medium	25	41	52	40
Understanding	High	0	9	28	13
		100%	100%	100%	100%
	n.	(20)	(22)	(25)	(67)

$x^2 = 13.78$, 2df., $p < .005$

Table 6. Complexity of Recall of Liked and Disliked Commercials by Cognitive Level[8]

		Cognitive Level			
		Low	Medium	High	Total
Level	Low	23%	22%	7%	16%
of	Medium	58%	39%	39%	44%
Complexity	High	19%	39%	54%	40%
		100%	100%	100%	100%
	n.	(26)	(28)	(41)	(95)

Table 7. Perceived Truthfulness of Commercials by Cognitive Level.

		Cognitive Level			
		Low	Medium	High	Total
Do commercials always tell the truth?	Yes	30%	18%	8%	18%
	Sometimes	40	46	12	31
	No	30	36	80	51
		100%	100%	100%	100%
	n.	(20)	(22)	(25)	(67)

$x^2 = 13.89$, 2 df., $p < .001$

Table 8. Basis for Judging Truthfulness of Commercials by Cognitive Level.

		Cognitive Level			
		Low	Medium	High	Total
Basis for Judging Truthfulness	Perceptual	59%	30%	12%	31%
	Reality-test	23	50	84	56
	Don't know	18	20	4	13
		100%	100%	100%	100%
	n.	(17)	(20)	(25)	(62)

$x^2 = 13.21$, 2 d.f., $p < .005$

Table 9. Reason Why Commercials Do (Don't) Tell the Truth by Cognitive Level.

		Cognitive Level			
		Low	Medium	High	Total
Reason Why	Trusting	38%	32%	0%	20%
	Selling Motive	19	47	100	61
True/Untrue	Don't Know	43	21	0	19
		100%	100%	100%	100%
	n.	(16)	(19)	(24)	(59)

$x^2 = 36.94$, 4 d.f., $p < .001$

Table 10. Number of Commercials Recalled from Program by Nursery, Kindergarten and Second Grade Subjects

Commercials	Nursery	Kindergarten	Second
None	34	18	10
One	3	18	10
Two	1	3	14
Three or more	0	1	4
n.	38	40	38

Table 11. Level of Complexity of Recall of First Commercial Recalled After Program by Kindergarten and Second Grade Subjects

Level of Complexity of Recall	Kindergarten	Second Grade
Low	91%	29%
Medium	9	57
High	0	14
Total	100%	100%
n.	22	28

Table 12. Proportion of Conceptual Attributes to Total Number of Attributes Mentioned about First Commercial Recalled by Kindergarten and Second Grade Children after Watching Program.

Proportion	Kindergarten	Second Grade
.00	95%	54%
.01- .50	5	28
.51-1.00	0	18
Total	100%	100%
n.	22	28

$X^2 = 8.743$ (2df) $p < .01$

Table 13. Per cent of Nursery, Kindergarten and Second Grade Children Mentioning Conceptual Attributes in Affective Response to Seven Commercials Just Seen

Commercial	Nursery	Kindergarten	Second Grade
#1	6% N= (18)	18.8% N=(32)	53.1% N=(32)
#2	0 (24)	9.4% (32)	39.4% (33)
#3	0 (22)	17.1% (35)	22.6% (31)
#4	0 (27)	5.9% (34)	25.0% (8)
#5	0 (24)	5.4% (37)	18.2% (33)
#6	0 (16)	5.6% (36)	26.7% (30)
#7	0 (27)	5.6% (36)	21.9% (32)

N = Total number of Subjects Responding

Table 14. Descriptive Data: Sample of Commercial Sequences

Sequence Length	n.	%
1	109	21%
2	187	36
3	128	24
4+	102	19
	526	100%

Position of Commercial in Sequence	n.	%
1st	526	41%
2nd	417	33
3rd	230	18
4th	102	8
	1,275	100%

Table 15. Attention Level to Commercials at Each Position in the Sequence.

		Position in Sequence			
		1st	2nd	3rd	4th
Attention	Full	49%	41%	35%	19%
	Partial	21	21	17	20
Level	None	30	38	48	51
		100%	100%	100%	100%
	n.	(526)	(417)	(230)	(102)

Table 16. Stimulus Complexity Ratings of Commercials.

	Product	Visual Complexity Score	Auditory Complexity Score	Length
BLOCK 1	Clark Oil	High (.91875)	High (.89186)	30 seconds
	Clorets	Low (-1.5997)	High (1.1860)	30 seconds
	Skelgas	High (1.4379)	Low (-1.4194)	30 seconds
	Bromo Seltzer	Low (-1.8772)	Low (01.5517)	30 seconds
BLOCK 2	Hershey Instant	High (1.2680)	High (1.0437)	60 seconds
	Burger King	Low (-1.7144)	High (1.17436)	30 seconds
	Gatorade	Low (-1.1343)	Low (-1.7551)	20 seconds
BLOCK 3	Wonder Bread	High (.89608)	Medium (.37739)	30 seconds
	Snickers	Medium (-.57801)	High (.70379)	30 seconds
	Hostess Snack Cakes	Medium (.81763)	Medium (-.10981)	60 seconds
	Quickick	Low (1.2175)	Medium (-.32483)	30 seconds
	Chef Boy ar dee Pizza	Medium (.41223)	Low (-1.7346)	30 seconds

Table 17. Two-Way Analysis of Variance with Repeated Measures of Age by Stimulus Complexity on Attention Behavior for Irrelevant Product Commercials.

Sources of Variance	Reduced Sum of Squares	Degress of Freedom	Mean Square	F Value	Prob.
Age	13.68	2	6.84	9.17	p<.01
S (Age)	87.24	117	.75		
Stimulus Complexity	2.15	3	.72	7.40	p<.01
Age x Stimulus Complexity	.82	6	.14	1.40	.25>p>.01
Stimulus Complexity x S(Age)	34.21	351	.10		

Table 18.

A. Irrelevant Product Commercial Mean Attention Scores for Each Age Group*

Group	Means
Nursery	2.38
Kindergarten	2.78
Second Grade	2.68

B. Mean Attention Scores to Irrelevant Product Commercials

Commercials		
Visual Factor	Auditory Factor	Means
High	High	2.70
High	Low	2.53
Low	High	2.66
Low	Low	2.56

*In coding, full attention was given a score of 3, partial attention a score of 2, and no attention a score of 1.

Table 19. Two-Way Analysis of Variance with Repeated Measures of Age by Stimulus Complexity on Attention Behavior for Relevant Product Commercial

Sources of Variance	Reduced Sum of Squares	Degrees of Freedom	Mean Square	F Value	Prob.
Age	24.63	2	12.32	21.38	p .01
S(Age)	67.45	117	.58		
Stimulus Complexity	1.47	2	.73	8.64	p .01
Age x Stimulus Complexity	1.54	4	.39	4.54	p .01
Stimulus Complexity x S(Age)	19.93	234	.08		

Table 20. Mean Attention to Each Relevant Commercial by Age Group

Commercial	Nursery	Kindergarten	Second Grade
High visual, High auditory	2.36	2.91	2.88
Low visual, High auditory	2.46	2.84	2.87
Low visual, Low auditory	2.10	2.87	2.78
HH - LL difference	.26	.03	.10

Table 21. A. Mean Attention to Relevant Product Commercials for Each Age Group

Group	Mean
Nursery	2.30
Kindergarten	2.87
Second Grade	2.84

B. Mean Attention to Irrelevant Product Commercials

Commercial Visual	Auditory	Mean
High	High	2.71
Low	High	2.72
Low	Low	2.58

Table 22. Irrelevant Product Commercials, Visual and Auditory Dimension Mean Attention Scores

Auditory Dimension		Visual Dimension	
High	5.68	High	5.61
Low	5.55	Low	5.61

Table 23. Percentage of Stable Transitions in Irrelevant and Relevant Product Blocks by Age.

		Nursery	Kindergarten	Second Grade
First Block - Irrelevant Commercials		68%	82%	76%
	n.	(581)	(591)	(608)
Second Block - Relevant Commercials		76%	82%	84%
	n.	(560)	(552)	(552)

Table 24. One-Way Analysis of Variance on Attention Change Score for Nursery, Kindergarten and Second Grade Subjects

Sources of Variance	Degrees of Freedom	Sum of Squares	Mean Square	F Value	Prob.
Between	2	393.6	196.8	34.179	p .001
Within	117	673.725	5.758		
Total	119	1,067.325			

Group Means

Nursery School	2.9
Kindergarten	1.8
Second Grade	2.1

Figure 1. Full Attention to Program and First Commercial by Cognitive Level.

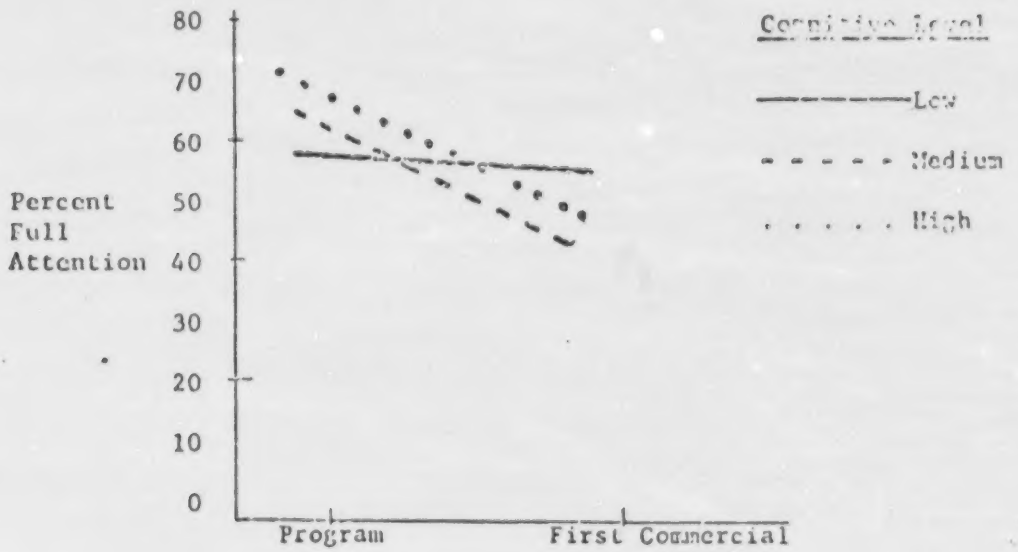


Figure 2. Full Attentic[redacted]mercials at Different Positions in the Progra[redacted]tive Level.

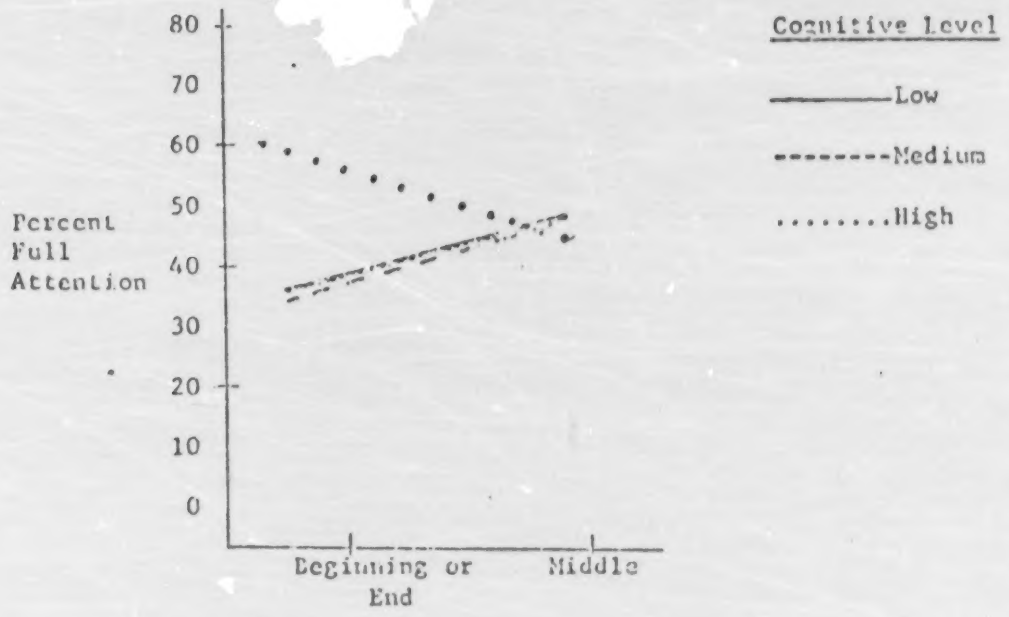


Figure 3. Full Attention to Commercials for Different Product Types by Cognitive Level.

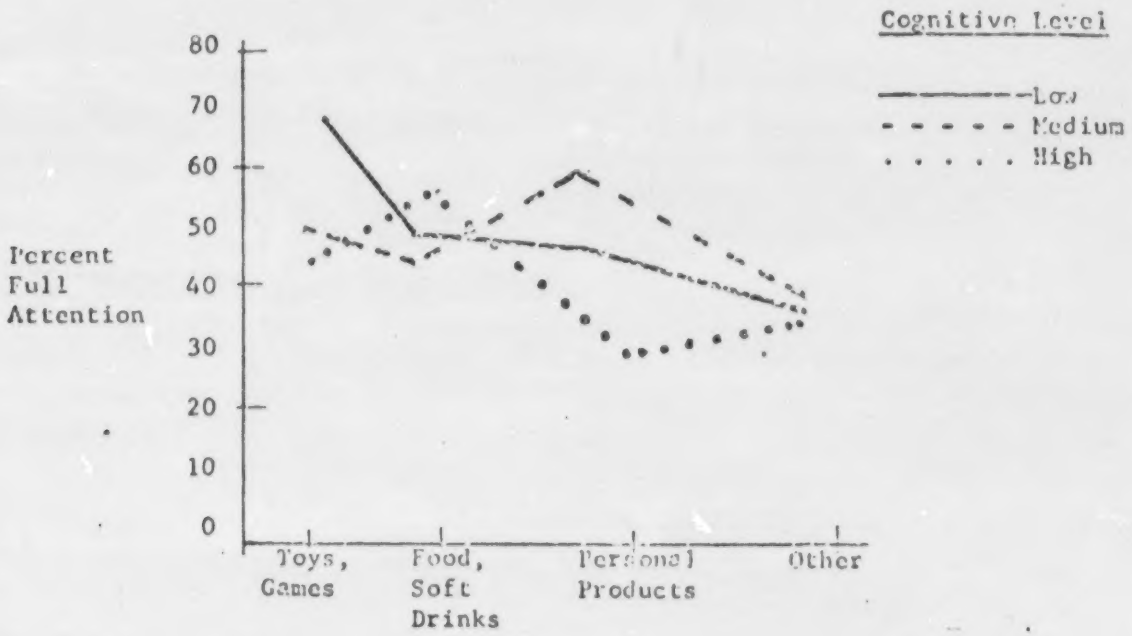


Figure 4. Full Attention to Commercials at Different Times in the Week by Cognitive Level

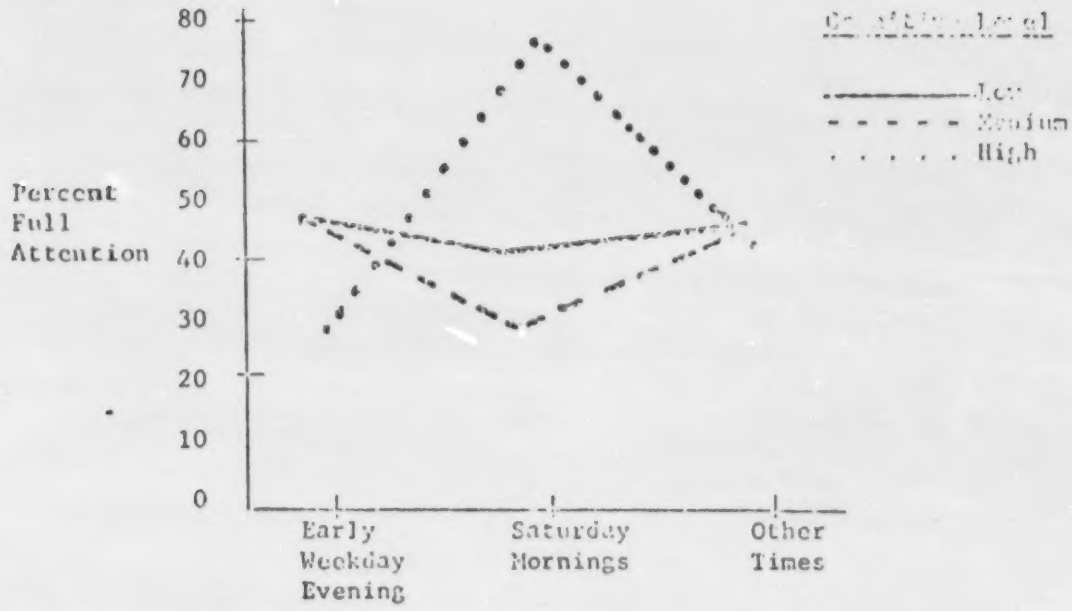
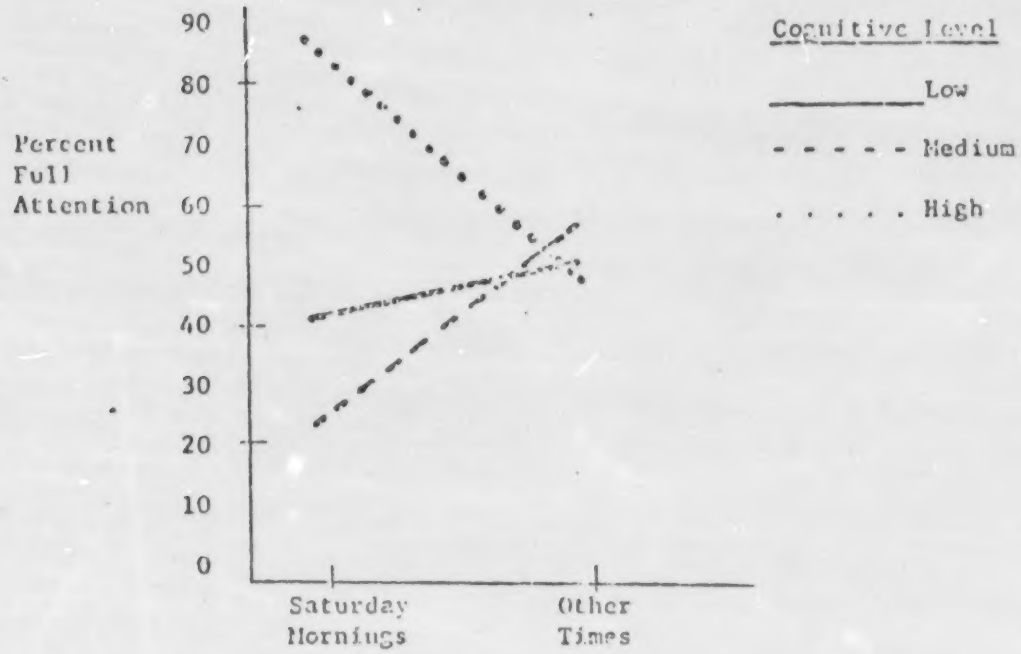
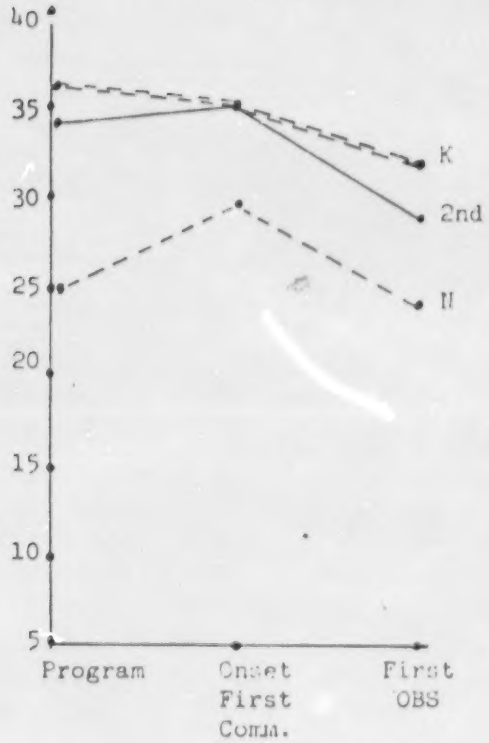


Figure 5. Full Attention to Food or Soft Drink Commercials on Saturday Mornings and at Other Times by Cognitive Level.

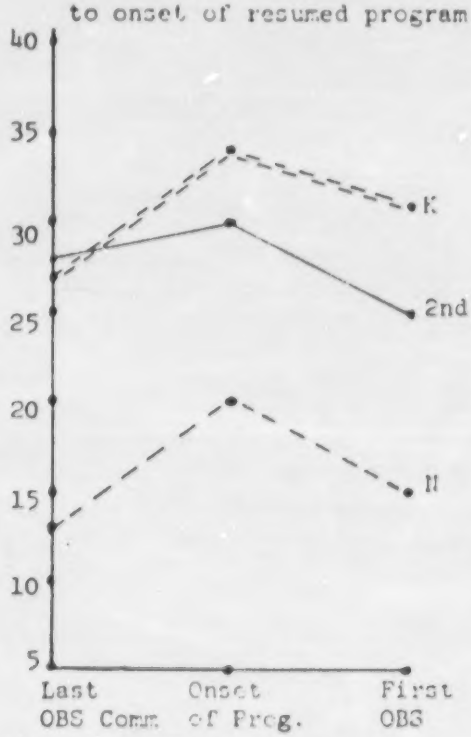


Number of Subjects at Full Attention During Transitions from Program to Commercials, and Vice Versa, by Age Group.

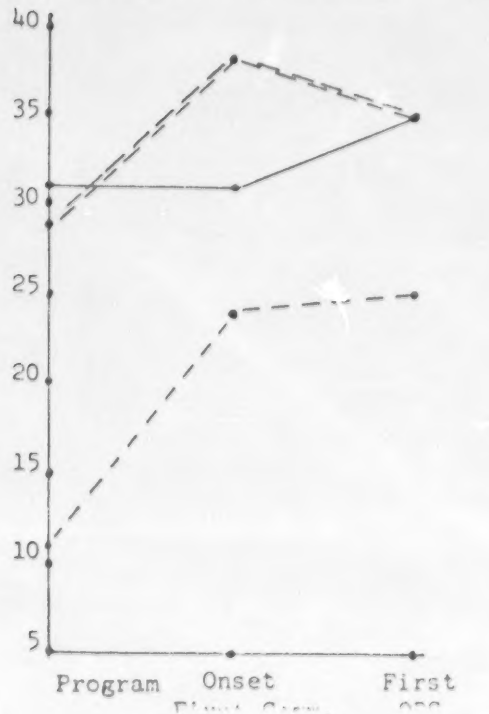
Subjects at full attention during program to onset 1st commercial irrelevant block.



Subjects at full attention during last OBS. of commercial in irrelevant block to onset of resumed program.



Subjects at full attention during program to onset 1st commercial relevant block.



Subjects at full attention during last OBS. commercial in relevant block to onset of resumed program.

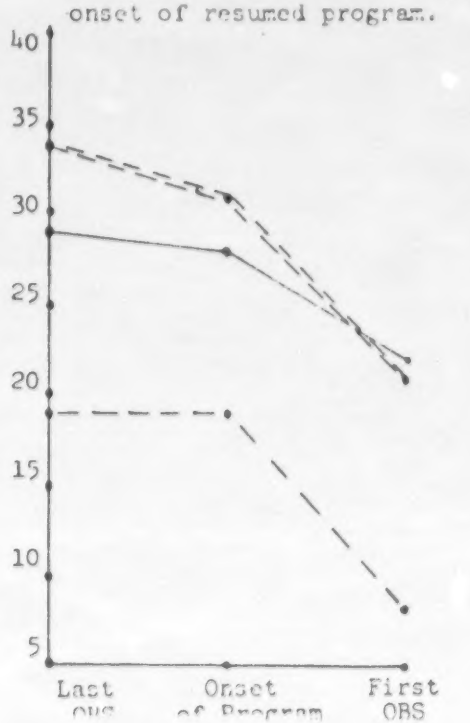
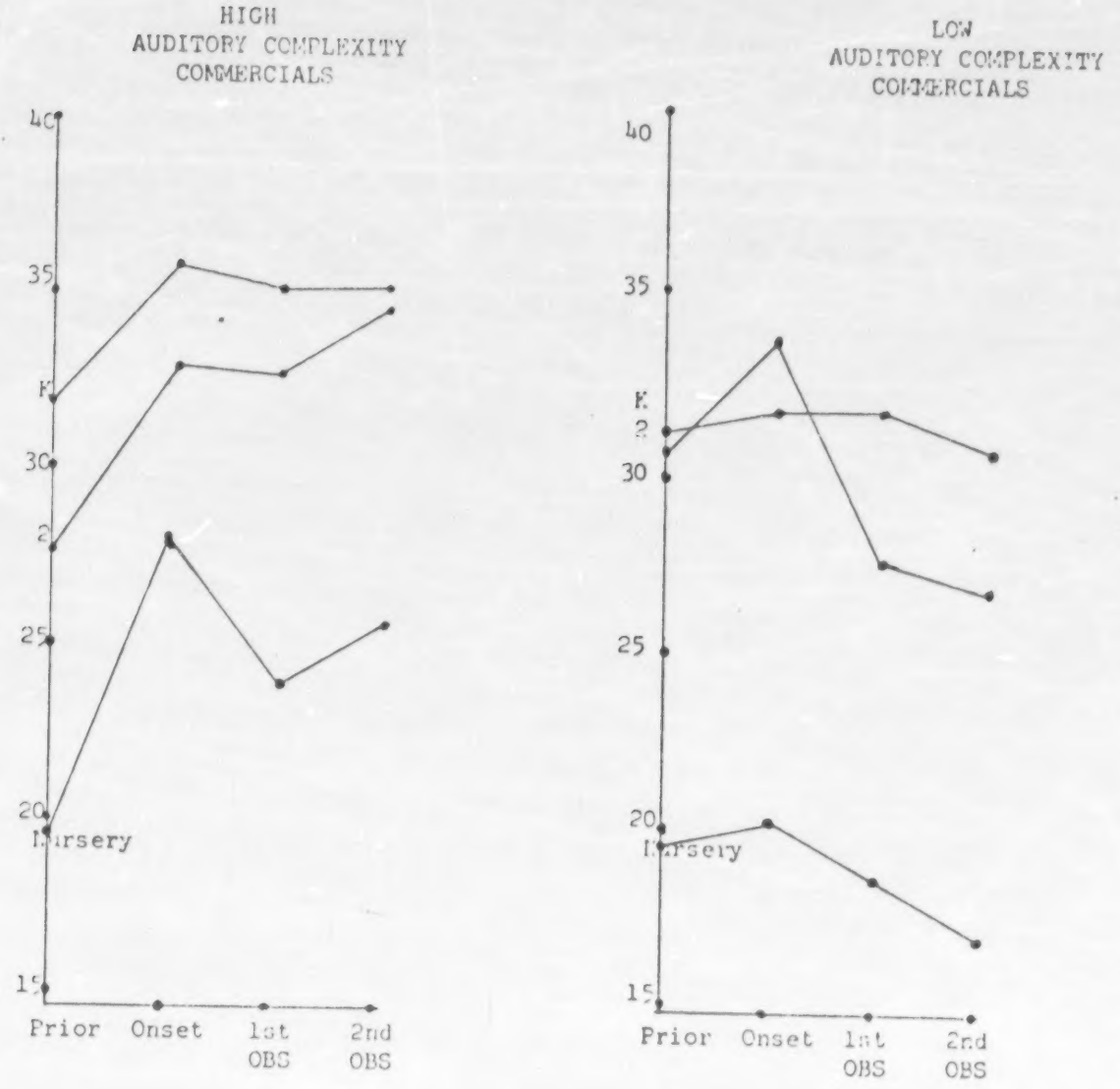


Figure 7

Number of subjects at full attention prior to, at onset and at first two observations of commercials high and low in auditory complexity



NOTES

[1]See Flavell (1963) and Ginsberg and Opper (1969) for extensive reviews of Piaget's theory and the data supporting it.

[2]The concrete operational child is not able to function cognitively entirely outside the perceptual world, however; this does not occur until the formal operations stage. Only in this stage is a child able to perform mental operations on purely abstract concepts. We must hasten to add, however, that the formal operations child doesn't deal only with abstractions. Rather, he has the ability to do so when he wants to, unlike the concrete operational child who cannot think in pure abstraction.

[3]See Flavell (1963) for a summary of a number of studies concerning the invariance of stages and cultural differences in the age at which various structures are learned.

[4]Watt and Krull's (1972) measure of style is a measure of stimulus complexity, based on the information theory concept of uncertainty, or randomness of change in a stimulus. Their measure involves content analysis of television in terms of six iconic (i.e., perceptual and content-free) variables, and factor analysis of these variables. Measurement of prime-time television shows yielded a two-factor structure which predicted program preferences of adolescents better than several other content analysis schemes. In the present study, applying this method to 40 commercials yielded a two-factor structure which was different from the factor structure for prime-time shows. The two factors in the present study are a visual complexity factor and an auditory complexity factor.

[5]In this table, and in a number of others, rows of the table are collapsed for purposes of statistical testing. This was done because of the small cell sizes in certain rows in these tables.

[6]Sex of the child is not related to cognitive level.

[7]Differences in complexity of recall may be partially dependent on differences in memory of children of various ages. However, it should be noted that many information processing theorists (e.g., Simon, 1972; Inhelder, 1972; Hagen, 1972) conceptualize long-term memory as a set of strategies or structures for processing information, i.e., precisely the structures Piaget's theory is concerned with. Thus, according to these theorists, if an older child can recall more facts and can relate them more cogently, it is not simply because he can store more information, but rather, it is because he possesses better structures for storing and recalling information.

[8]In Tables 6 and 7, most respondents are represented twice because they answered the same question twice, once concerning their favorite commercial and the second time concerning their most disliked commercial. Responses to the favorite and most disliked commercial formed essentially

the same pattern; therefore, including the two sets of responses in the same table is justified.

[9]In terms of the children's present behavior, analysis of current TV viewing indicates no difference among children of the three cognitive levels in the amount of time spent watching TV.

[10]The perceptual boundedness questions were: "What is the difference between a school and a home?"; "What is the difference between a car and a truck?"; "What is the difference between a mother and a father?" Each of these questions can be answered in terms of perceptual aspects or in terms of conceptual, functional aspects.

[11]Watt and Krull's (1972) content analysis of the prime time shows indicated that most shows clustered quite closely together in terms of style. A similar result was obtained when 40 commercials were content analyzed in preparation for the experimental study reported here. These two content analyses therefore support this proposition.

[12]Commercials at the beginning and end of the program were grouped because of small sample size.

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